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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/584,729

06/23/2006

Koichiro Tanaka

0756-7709

6076

31780

7590

03/27/2008

ERIC ROBINSON

PMB 955

21010 SOUTHBANK ST.

POTOMAC FALLS, VA 20165

EXAMINER

EVERHART, CARIDAD

ART UNIT

PAPER NUMBER

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MAIL DATE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/584,729	<b>Applicant(s)</b> TANAKA ET AL.	
	<b>Examiner</b> Caridad M. Everhart	<b>Art Unit</b> 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>6-23-2006</u> . | 6) <input type="checkbox"/> Other: ____.  |

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by  
Allan et al (US 2002/0070352A1).

Allan et al discloses a method for forming a three-dimensional crystal structure(paragraph 0013) by using multiphoton absorption(paragraphs 0013 and 0022). The sample is on a stage that can be translated(paragraph 0035). Only the desired areas are crystallized by this method(paragraph 0031). Materials such as glass which includes silica may be processed(paragraph 0034). The frequency of the laser is greater than 10MHz(paragraph 0022).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 3,6-8, and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allan et al as applied to claim 1 above and further in view of Fukumitsu et al (US 2006/0144828A1).

Allan et al is silent with respect to the recited limitations concerning the laser and the condenser and the power.

Fukumitsu et al discloses forming a modified region by multiphoton absorption in a semiconductor (paragraphs 0007, 0041, and 0064). There is melting and change in the crystal structure in the melted portions(paragraph 0064). Either the laser beam or the

stage holding the substrate can be moved(paragraphs 0009 and 0110). Fukumitsu et al further discloses that the pulse width is in the femtosecond range(paragraph 0087) , that a fundamental wave of a laser such as a NdYAG laser is used(paragraph 0047), and that the power is within the recited range(paragraphs 0036 and 0092). Fukumitsu et al further discloses that in the processing of a semiconductor substrate using multiphoton laser, the condenser is made up of a plurality of lenses and is cylindrical(paragraphs 0087 and 0092). The beam shape can be chosen as desired including linear(pargraph 0067).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the apparatus and settings taught by Fukumitsu et al with the method taught by Allan et al in order to obtain the desired results in the case of silicon crystallization.

Claims 14-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allan et al in view of Fukumitsu et al as applied to claim 2 above, and further in view of Maegawa, et al (US 2004/0087118A1).

Allan et al in view of Fukumitsu et al is silent with respect to activation by multiphoton absorption.

Maegawa et al discloses the formation of a junction by implantation and activation by phonon excitation in the substrate(paragraphs 0008 and 0009).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have applied the method taught by Allan et al in view of Fukumitsu et al to the process taught by Maegawa et al in order to obtain the benefit of not heating the

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substrate excessively in the activation processs in order to obtain a shallow junction as taught by Maegawa et al .

The prior art of record not relied upon is considered relevant to applicant's disclosure.

Yamada et al (US 2003/0213770A1).

Yamada et al discloses forming a linear beam for the irradiation of a substrate by using a condenser(paragraphs 0122, 0123, 0132, and 0155).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Caridad Everhart/  
Primary Examiner  
AU 2891

3-24-2008